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to lower the estimation in which it is held. They are unwilling, that the College should diminish the magnitude and value of its gifts, for the sake of dispensing them to a greater number of persons. The experience of one or two years will probably show how groundless was the expectation, on which the authors of this system have acted, that a large body of students would be attracted to Cambridge by such a free and conciliatory proposal. Then, if not before, we hope they will be willing to retrace their steps, and to stake the reputation of Harvard College, not on the numbers enrolled in its Catalogue, but on the extent, accuracy, and thoroughness of the education obtained within its walls.

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ART. III. — *A Report on the Insects of Massachusetts Injurious to Vegetation.* By THADDEUS WILLIAM HARRIS, M. D. Published agreeably to an Order of the Legislature, by the Commissioners on the Zoölogical and Botanical Survey of the State. Cambridge: Folsom, Wells, & Thurston. 1841. 8vo.

FEW things in the history of Massachusetts have manifested a more enlightened self-interest, than the appropriations for scientific purposes, to which we are indebted for this Report. Public measures of this description are easily misrepresented; and those demagogues, who are the pest and shame of every free community, are always on the watch for subjects which can be thus perverted, since in this way they can turn aside the public mind from too close investigation of their own character and proceedings, and at the same time gain credit for a regard to the interests of the people, while they care for nothing but their own. It is easy to show, that the State is to gain nothing in dollars and cents by such a Report as this, and therefore to represent the pittance by which the State secured the services of this eminent naturalist, as a magnificent and wasteful appropriation, though, in comparison with what would anywhere else be paid for such labors, it was in fact exceedingly small. When an outcry on the subject of economy can be so easily raised, and when jealousy in regard to public expenditure is so easily excited, we think it very honorable to the Massachusetts legislature that they should

have treated this danger with contempt, and taken large views of what concerned the interest of their constituents. We venture to say, that this work before us will survive a thousand state papers which came into existence at the same time, and which are already, like the falling leaves, on the way to their original dust.

Several of the legislatures of the different States, taking the same judicious view of their duty, have made appropriations for geological surveys of their territory, and in that way have brought to light rich and unsuspected treasures, which were hidden beneath their soil, and which might otherwise have lain there for ages longer, useless and unknown to mankind. In these cases there was an obvious inducement to undertake and persevere in such enterprises, since it was certain that mines, quarries, or at least materials for improving the soil, must be discovered ; and each one who builds a house or cultivates a field may hope for direct advantage from the investigation. But when a zoölogical survey is proposed, there is no such immediate inducement to undertake it, and the advantages in prospect are of a kind which it requires some thought and forecast to understand. Still, we do not hesitate to say, that, deservedly honored as Professor Hitchcock's Reports have been, none of them were of greater importance than the one before us. If the same facts respecting insects had been presented to the public a quarter of a century ago, some of her most valuable forest trees might have been saved to New England, vast amounts of the productions of the earth would have been rescued from destruction, and many enterprising men who have made efforts to improve horticulture and its kindred arts, would have been prevented from giving them over in despair. It may be said, that this Report, in many cases, only states the evil, without proposing a remedy. This is true ; but it must be remembered, that no remedy can be devised till the nature of the evil is understood. It is the province of science to detect such facts, and give them to the world ; and then, knowing precisely what needs to be done, the active sagacity of practical men will not be slow to find the sort of antidote wanted. Many a sturdy cultivator, harassed and perplexed by the insidious forays of these unseen marauders, has prayed, like Ajax, that he may have the privilege of fighting them in the light and the day ; and now, when, through the instrumentality of Dr. Harris, his desire is granted, we

may be sure that, even if baffled and defeated for a time, he will at last exterminate the foe. If then no money is to be made in consequence of this Report, there is no doubt that large amounts of agricultural wealth will hereafter be saved from destruction ; and, if any one insists on more direct benefit than this, his expectations are of that kind which it is as hard to gratify as it is easy to form.

It is really curious to see how the animals around us are formidable, not in proportion to their size and presence, but rather to their littleness and obscurity. Since the days of the dwellers in Samaria, we hear of no race of men who are much troubled with lions. That large and powerful beast is easily disposed of. If it resists, it is destroyed ; and if it submits, it is led about in a cage to expire at last "a driveller and a show." But the smaller fry of creation laugh at the idea of such bondage. The mosquito, for example, can no man tame. He sounds his horn through our chambers in wild independence. The blow which we aim at him falls heavily upon our own heads. At the very moment when we are calling ourselves lords of the creation, his venomous bite destroys all our composure of mind, and makes us feel that the little are mightier than the great. The amount of injury inflicted on man by the larger animals, is nothing compared to that which we suffer from these creatures, of no mark nor livelihood, whose insignificance is their shield and safeguard. Dr. Harris has described their persons, traced out their operations, and put the public on their guard against them ; if, after this, we choose to lie still and be eaten by them, the blame and responsibility is our own. As it is not the part of the naturalist to find the remedy, Dr. Harris makes no mention of that, which we have, elsewhere in this journal, declared will be the only effectual one. We mean, adopting retaliatory measures, and giving them to understand that if they eat us, we shall eat them. This is certainly the alternative to which we at last must come ; but at present the public mind is not quite prepared for it, and we have no resource but to keep on in our Florida war against them, in which we can hope neither for vengeance nor victory, and which promises to end only with the history of man.

In preparing such a work as this, there is some difficulty in determining how far it is desirable to give it a scientific

form. It is clearly intended for popular use, and, unless it be easily comprehended, it must be useless to the great body of those for whom the survey was intended. In the case of birds, where the species are comparatively few in number, popular names are sufficient, and it is easy for any one, who attends to the subject, to make himself master of them ; but insects are so overwhelming in numbers, and many of them so obscure in appearance, that a great proportion of them have not been honored with a popular name, and, where they have, it is not always sufficiently distinctive and characteristic to enable any one to identify the creature to which it belongs.

This is forcibly shown by Dr. Harris in relation to the weevil, a notorious depredator, whose name is often heard. It is applied in this country to at least six different insects, two of which are moths, two are beetles, and two are flies. It is a fact, too, that nearly four thousand species of weevil have been scientifically ascertained and described, so that, when the name is used in an agricultural work, the chance is, that neither writer nor reader knows to which of the four thousand the name belongs. No mortal could undertake to christen them with four thousand expressive English names ; and, if it were done, no human memory would hold them. But science has arranged them all under three hundred and fifty-five sur-names, requiring only a few other terms, like Christian names, to indicate the various kinds. Thus, the single word *Coleoptera* describes the vast family of beetles, from those which blunder into our faces on a summer evening, to those which afford pleasant relief to pain in the shape of a blister. *Orthoptera* includes the crickets and grasshoppers of the field, and the easy and familiar cockroach of our houses. *Hemiptera* denotes a large and interesting circle, provided with a horny beak for suction, and four wings ; such as locusts, tree-hoppers, plant lice, bark lice, mealy bugs, and the like, some of which afford us cochineal, lac, and manna, while of the rest some are unsavory, and all unwelcome. *Neuroptera* describes insects, stingless, but provided with jaws and four netted wings, from the little death-watch, who reminds man of his mortality, to the philanthropic devil's needle, who, for his services in killing mosquitos, deserves a better name. *Lepidoptera* is the name of all the moths, butterflies, and sphinxes, or insects which make their *début* as caterpillars, and afterwards arrive at the dignity of wings with branny scales and a

spiral tongue. *Hymenoptera* applies to bees, wasps, and numberless others with four veined wings, and provided with jaws at one end of the person and a sting at the other. *Diptera* is affixed to those which have a proboscis either horny or fleshy, two wings, and knobbed threads called *poisers* or *balancers* behind them ; and this single term embraces ticks, gnats, mosquitos, horse flies, forest flies, stable and house flies, blow flies, meat flies, and the viviparous flesh flies, flower flies, and fruit flies, not forgetting those distinguished nuisances the wheat and the Hessian flies.

Since a nomenclature of this kind has clear advantages, which can be secured by no other, there is obviously no choice in the matter ; but, lest any one should be needlessly alarmed at the scientific terms which he found it necessary to employ, Dr. Harris has given a preliminary description of insects and their classes, such as could be furnished only by one familiar as he is with the subject, and supplying all the previous information essential to be possessed. We hardly know where to find a summary so condensed, and, at the same time, so complete. It removes all difficulty at the outset ; and thus, while this Report is sufficiently scientific in its execution, to meet the expectations of the learned, it answers the more important purpose of placing the means of knowledge in every man's hands. In order to do this effectually, it must have a wider circulation than its present form will allow ; it ought by all means to be reprinted in a cheap edition, and spread as widely as possible. If this were done, a new vigor would be given to agricultural enterprise. The husbandman, as soon as he knows the enemies he has to contend with, considers the battle as more than half won.

Dr. Harris was induced, by the nature of his instructions, to consider the subject chiefly in reference to vegetation, and the enemies by which cultivators are harassed ; which certainly offers a field sufficiently large for any single observer, and one requiring time far more extended than that which this commission allowed. It has been said, that there are on an average six different enemies to every plant. This is probably only another way of stating that each plant has many destroyers ; but, when the number of species in the State is between four and five thousand, and all must get a living by some means or other, it is clear that no plant worth taking has much chance of escape ; and the insects very naturally

infer, that what is best for man must be best for insect too. The thought of such an army, all engaged in foraging upon man's dominions, is enough to fill the cultivator with dismay ; and many, finding the havoc made among their fruits and flowers by these innumerable agents, have left the field in despair. But, properly regarded, it appears to be one of those evils which are necessary to bring out the energies, to quicken the attention, and to call into action those higher faculties which make the human animal a man. Doubtless it would be pleasanter to the housewife, to be exempt from the visitation of those spectres which make night hideous, and to live where no moth might corrupt food and raiment ; the agriculturist, too, would be greatly delighted, if all his minute persecutors, like those which once infested Egypt, could be swept off wholesale to the Red Sea. But the question is not what they would like best, but what would be best for them ; and, thus considered, it is evident that these, like all other physical inconveniences, are blessings in fantastic disguises, and could not be removed without opening the way for evils more evil than themselves. This very Report is an illustration of the good which may come from being thus afflicted. Here are great intelligence, observation sharp as a needle, and unflinching patience, devoted to the investigation of the subject. The naturalist takes hold of it with his grappling irons, and will not let it go, till he has traced the insect through all its changes in its underground caverns, enabling us to distinguish foes from friends, and showing us where, in case we proceed against them, our efforts can be best applied. But this is not all ; for out of this field, apparently so unpromising, he has drawn rich and beautiful illustrations of wisdom and goodness, which force from us the acknowledgment, that, little as we love them, " the hand that made them is divine."

We do wrong, however, to speak always, as if all the insect race were at war with man. Nor indeed can it be truly said of any. The worst they can be charged with, is, pursuing their own interest without regard to ours ; and, if this be a sin, they can plead various human examples in mitigation of damages ; and they may reasonably demand of us to show, why that same course of conduct should be worthy of death in a bug, which is so much praised and honored in man. As we become better acquainted with them, we inva-

riably find that their injuries are less, and their services greater, than we had supposed. Sometimes the injury itself, as it seems, results in good, long after the insect is hunted down. From our past experience we may infer, that their reputation will continue to rise, since the harm they do is obvious, but the good is more slowly developed, and, therefore, later discovered. We already know that in the first order, of *Coleoptera*, the tiger, the ground, and the diving beetles, and the well-known lady-birds, who, though so often warned of the danger of their house and family, persevere in their labors in the orchard, are very efficient coadjutors with birds in removing the destroyers of trees. Many others, of unsavory name and habits, work as scavengers, in removing filth which would otherwise pollute the air. There are others, which fasten themselves on corrupt vegetable matter, and help forward that process of decay, which converts the dead plants into nourishment for the living. Surely, tried by this standard, insects are far from deserving to be trodden down; and if the day ever comes when usefulness shall be the title to respect, many a poor bug will rise into glorious eminence by the side of many men who have been honored and admired by the world.

In the first order, *Coleoptera*, or insects with sheathed wings, are some which are very injurious to vegetation, both when they have taken to themselves wings, and also in the earlier stages of their existence; particularly those called *Melolontha*, because they were oddly enough supposed to proceed from the flowers of apple trees, as the name implies. We have nothing which compares with the European cock-chaffer in numbers, nor in the extent of its depredations. But our May beetle is sufficiently troublesome in devouring leaves, to make it necessary to proceed against it; which can be most effectually done, as Dr. Harris suggests, by shaking the trees in the morning, when they do not attempt to fly, and collecting the insects from the ground. The grub is a great destroyer of the roots of grass; but it is kept down by crows and barn-door fowls, not to mention the skunk, whose merits are now so little acknowledged, but who will doubtless be in better odor, when this important fact in his history is generally known.

The most destructive of these insects is the rose-chaffer, or rose-bug, as it is generally called, which has for many



years been increasing in numbers, and bids fair to multiply to an indefinite extent, since nothing short of crushing can destroy its tenacious hold on life. When it was first noticed, it was very mysterious in its visitations. Vines were found covered with it, where there was not one the day before. At first it confined its attentions to roses, when they could be had ; but now grape vines, fruit trees, forest trees, and vegetables of the garden, are covered by these pests, which cling to them in silent indifference to all that man can say or do. It is now found, that this is one of the cases, in which troubles come from the ground. The opening of the damask rose is the signal for its rising ; all that are ready to take wing come forth, rejoicing in the privilege of doing more mischief above ground than they have been able to do below. All their transformations are completed in a year. In the month of July, the females enter the ground, lay their eggs, and then return to the upper air to die. The eggs of each are about thirty in number, and are deposited from one to four inches beneath the surface. They are hatched in twenty days, and the young grubs immediately begin to feed on the roots within their reach. In October, they descend below the reach of frost, and pass the winter in a torpid state. In the spring, they return to the surface, where each one fashions for itself a little oval cell, in which it completes its transformations. Since it is thus entirely beyond our reach in the earlier stages of its existence, there is no resort but to shake it from the trees, and gather it from the fruits and flowers. All the efforts of birds, devil's needles, and other friends of humanity, are wholly insufficient to keep their numbers down.

The family of weevils belong to the first order, and the name is sufficiently well known not to belong to a public benefactor. The most common with us, perhaps, is the pea weevil, though every eater of green peas is employed in reducing their numbers, and with a success which must be very gratifying to a benevolent heart. During the flowering season and immediately after, the insect pierces the tender pod, laying one egg in each seed, from which a small, light-colored grub proceeds without much delay. By the time the pea becomes dry, the weevil has reached its full size, and begins to bore its way from the centre to the hull, generally without injury either to the hull or the germ. By the spring it becomes a beetle, and gnaws a hole through the hull in order to

escape into the air. The weight of the pea is diminished about one half by this operation. If the pea is eaten whole when dry, the beetle is generally eaten with it ; but though revenge may be sweet, the flavor of the pea-bug adds little to the amount of gratification. It is very considerate on the part of these vermin to spare the germ, so that a pea will grow when sown, even after it has been eaten almost to the shell ; but this forbearance is probably exerted in favor of the children of pea-bugs, rather than of men.

One of the most pernicious of the weevils is that which takes its name from the white pine. This tree is the pride of the American forest, distinguished for its beauty of form, and very important in ship-building. Its value for masts depends very much on the straightness of the stem ; and if the leading shoot be destroyed, the tree is deformed and rendered useless. Upon this shoot, the eggs of this nuisance are laid. The grubs produced from them bore into the wood in various directions, and, after doing all the mischief in their power, come out in September and October, leaving the shoot perforated in such a manner that it cannot recover. Happily a sort of ichneumon-fly finds his interests identical with those of man, and manages to put an end to the ravages of this destroyer, where human power could not reach him.

But the most troublesome of the weevils are those which officiate in our gardens. Every horticulturist knows to his sorrow, that his unripe apricots, plums, peaches, and cherries, fall in consequence of the doings of an insect, which stings the fruit as soon as it is formed, allotting one egg to each, and so proceeding with all upon the tree. This insect is the plum-weevil, and is the same which may be found in the black excrescence, that so often disfigures the plum tree, the branches of which, as Dr. Harris supposes, they resort to in default of fruit, should there be none upon the trees when they happen to rise out of the ground. His advice is, that, when the insects are seen in the beetle form, and are engaged in laying their eggs, the trees should be smartly shaken every morning and evening. The insects do not attempt to fly, but contract their wings and fall ; they may thus be caught in sheets spread under the tree, and disposed of at pleasure. All the fruit which falls in consequence of their attacks, should be carefully gathered, and the diseased excrescences should be cut from the trees and burned, before the last of June.

But while the depredations on the orchard are the most vexatious, the injury done to forest trees is a more serious evil, since it is not so easy to point out the means by which it may be arrested. The painted Clytus has acquired an infamous notoriety from its destruction of the locust-tree, one of our most beautiful and valuable trees, both for timber and shade. The insect is gay in appearance, and, to see it glittering in its gold-laced suit of black velvet, no one would suspect its true character. It is a remarkably civil beetle, at least to those of its own race ; since two hardly ever pass each other without a profusion of bows. But the female lays its eggs in the crevices of the bark, and, as soon as the grubs are hatched, they aim at the inner parts of the tree. The winter renders them torpid ; but in the spring they mine into the wood, till the branch or stem is disfigured and perforated in such a manner, as to be easily broken by the wind. The consequence is, that the trees, when the insects prevail, become unfit for ornament or use ; and, as no means have been thus far devised, which have the least effect to destroy or repel the enemy, the cultivation of the locust-tree must be abandoned. They cannot even be disposed of by giving up the tree for a time ; for we see the insect feeding on the blossoms of the golden-rod, and, if deprived of one kind of food, they will easily supply themselves with another.

Unfortunately the sugar maple, another of our forest trees, has fallen under the destroying ravages of another Clytus, called *speciosus*, or the beautiful, a name to which, if its doings alone are regarded, it is but poorly entitled. Those who have cultivated this tree, have seen the progress of decay commence at the end of one of the limbs, and gradually extend, till the whole were dead ; but, till the Reverend Mr. Leonard, of Dublin, New Hampshire, traced out the cause, it was very little known. This large insect, about an inch in length, lays its eggs on the trunk of the maple in July and August. The grubs, as soon as hatched, burrow in the bark, and are thus sheltered during the winter. In the spring they penetrate the wood, forming long, winding galleries up and down the stem. About midsummer, they are changed to beetles, and prepare a race to succeed them in their destructive labors, and to finish what their short-lived sires begun.

Among the beetles are found the *Cantharides*, which are more useful in medical practice than injurious in agriculture ;

beside that the circumstance of their value to the sick operates to keep down their numbers. Four kinds of our native cantharides have already been used by physicians, and are found as powerful as those which are imported from the south of Europe. One is commonly called the *potato-fly*, an insect of a yellowish red color, with black stripes on the thorax and wing covers, whence it derives the name *striped Cantharis*, by which it is most properly known. It eats the leaves of potatoes and other vegetables, and becomes formidable from its numbers. Another is found on our beautiful wild clematis, the lower parts of which they strip of the leaves. The most destructive cantharis is called the ash-colored, and is found on the English bean, on the potato-vine, and also on hedges of the honey-locust, the beauty of which they entirely destroy. Another, of a jet black color, is found on the tall golden-rod, and also on potato-vines, though the former is their favorite food. These different kinds are collected and sold, without the difference between them being noticed. They can be taken by sweeping the plants which they frequent with a deep muslin bag-net, from which they may be thrown into boiling water for two or three minutes, and afterwards spread out on sheets of paper to dry. There are other blistering beetles of the genus *Meloe*, sometimes called *oil-beetles*, the most common of which is a blue insect nearly an inch long, found in the autumn on butter-cups and potato-vines, and called the *narrow-necked oil-beetle*.

The second order, *Orthoptera*, or straight-winged insects, contains the grasshoppers, and others which are injurious to vegetation, not by reason of their insidious attacks, so much as by their overwhelming numbers. Dr. Harris complains of the confusion occasioned by the misappropriation of names in this family. In America, the name of *locust* is given to the *harvest-fly* of English writers, or the *Cicada* of the ancients, while it ought to be restricted to certain kinds of grasshoppers. Our *earwig* is not the creature known by that name abroad, and laboring under the absurd reproach which its name implies. The little creeping thing abounding in legs, which we call earwig, is not even an insect, and the veritable earwigs which are found among us are too few to do any harm. The cockroach, one of our imported blessings, hardly comes within our author's sphere, since its labors are wholly domestic ; he therefore passes by it, simply recommending

that a dose of red lead, Indian meal, and molasses, be served up to them, till they have eaten their fill. The cricket, which is commonly thought to be, like the former, an inmate in our mansions, only enters them by accident ; the field is the scene of his music and operations. The music is produced by grating his wing-cases upon each other, thus producing a discordant sound, which is made tolerable, and even pleasant to some, by means of poetical associations. Their labors are incessant, but not much noticed, because they do not confine themselves to a single plant, but eat almost any which are sufficiently tender. Among the crickets is a small white kind, which conceals itself by day among the leaves and stems of plants, and at night makes a wearisome and incessant noise with its wing-covers. When any one finds its way into a chamber, not even the innocent will find repose that night.

The race of grasshoppers is much the most numerous and important. Favored by their leaf-like form and color, they can easily escape observation, while they devour the foliage, and commit many depredations in a quiet way, which does not attract the attention of the public till they see the great amount of mischief which is done. These insects commit their eggs to the ground, encasing a number together in a sort of varnish, which serves to protect them from decay. These commonly remain in the ground till the next spring, when the young are ready to begin their labors upon the young vegetation as soon as it rises from the ground. Of this family the *Katy-did* is the most remarkable. It is well known for the noisy pertinacity with which it sings the syllables which form its name. The sound is so quarrelsome, and therefore so decidedly human, that it is difficult to persuade one's self there is neither anger nor voice concerned. It proceeds from a thin, transparent membrane, stretched over a portion of the wing-cover. The wing-covers are so very large, as to enclose the whole body of the insect like a pod ; and when these are opened and shut, the parts in question grate upon each other ; the sound, being reverberated by the membrane and the concave wings, becomes very loud and shrill, reaching to a great distance, and so exactly resembling a colloquy of scolding vixens, as to be intolerable to a lover of peace. Some seem to bring the charge with great zeal and bitterness, "Katy did, she did," while others with equal exasperation declare, "She did n't" ; and so the matter is debated, very

much after the fashion of a night session in Congress, with a monotonous repetition of the same empty assertions ; and nothing can put an end to it but the morning beams.

Dr. Harris has given a description of the little green grasshopper, with a brown stripe on the head, which is found in our fields by millions, but has never before been honored with a name. Or rather there are two ; one of which he calls *Orchelimum vulgare*, the common meadow-dancer ; the other, from its form, the *gracile*, or slender meadow-grasshopper. They do not distinguish themselves by any shrill or troublesome noise, nor are they known to be very injurious to mankind ; and these, according to man's usual award in such cases, have lived till now unhonored and unsung.

The various insects included under the name of locust have long and narrow wing-covers, which meet and form a ridge over the back, resembling a roof. The males are not provided with cymbals and tabors like the former ; but instead of these, they have a cavity closed by a thin piece of skin stretched over it, which, like the body of a violin, helps to deepen the sound. When a locust performs, he bends the shank of one hind-leg beneath the thigh, where it is fitted in a furrow designed to receive it, and then draws it up and down the edge and veins of the wing-cover. He does not play both fiddles together, but alternately, first one, then the other. In this country, locusts are not distinguished from grasshoppers ; but, beside the difference of their musical instruments, the locusts greatly exceed the latter in their power of flight. Their wing-covers being smaller, do not impair the efforts of their wings, and the wings themselves are moved by strong muscles, and are strongly put together. They do not compare in size and destructiveness with the locusts of Asia ; but we hear at times of extensive ravages made by grasshoppers, which are really owing to locusts, and which show that they can be formidable from their numbers. President Dwight in his "Travels," gives an account of an irruption of the kind in Vermont, where they destroyed clover, Indian corn, and even the burdock and tobacco plant ; so voracious were they, that if the garments of laborers were exposed, these insects devoured them. They are no other than the little red-legged locusts, which are found on salt-marshes, where they sometimes consume the grass, and, as they die upon the spot, so taint with their decaying bodies

what little they have left, that it is rejected by horses and cattle.

The order *Hemiptera*, or half-winged, includes the formidable race of bugs, ninety-five species of which are enumerated elsewhere by Dr. Harris, as belonging to Massachusetts. Some, particularly those domestic animals which are called bugs *par excellence*, are already too well known to need a minute description. Of the out-of-door kinds, the squash-bug is one of the most notorious. De Geer, who first described it, gave it the name *tristis*, or sad, which would seem to belong more fitly to those who suffer from its visitations. On the return of warm weather, they return from the crevices in which they have passed the winter, and, as soon as the vines have put forth a few rough leaves, they are to be found on the vines, or beneath them, taking no pains to escape, and trusting for security to the acknowledged property, that they are less offensive to the senses while living than when dead. Their eggs are glued to the leaves, where the young are hatched, and, as soon as they come to life, begin to exhaust the leaves of their juices ; as soon as they have drained these, they pass to others, which they destroy in the same way. By taking some care to destroy the eggs and the young, which may easily be done, the insects may be almost exterminated ; but, if this precaution be neglected, the injuries of the insects and the dry weather of summer will destroy the labor of the year.

We observe that Dr. Harris believes in the periodical return of the *seventeen-year locusts*, as they are called, though locusts they are none. They are of the group *Cicada*, and are distinguished by their broad heads, large projecting eyes, and most of all by their loud buzzing noise, which is produced by a pair of kettledrums, with which the creature is provided, and which it uses with little discretion. These are formed by convex pieces of parchment, finely plaited, and placed in cavities behind the thorax, where they contract and relax with great rapidity, and produce the sound in question, which can be heard a mile. These insects are first referred to in Morton's "Memorial," as "a numerous company of flies, which, for bigness, were like unto wasps or bumblebees, which appeared in Plymouth in 1633. They came out of little holes in the ground, and did eat up the green things, and kept up such a constant yelling as made

the woods ring of them." It is not clear that they observe the exact interval of seventeen years between the times of their coming. The grub must remain in the earth all the mean while, and perhaps circumstances induce some generations to take wing earlier than others ; but it seems to be established that they are, on the whole, entitled to their name. They have no resemblance to locusts in their destructive propensities, which is owing not to any uncommon forbearance on their part, but to the structure of their mouths, which renders it impossible. But they often break the branches of trees with their weight, and the female also inserts her eggs in the boughs, which soon wither and die. When the young are hatched, they let themselves fall to the ground, going to the lower part of the branch, and taking this leap of Leucate with the utmost coolness and deliberation. When they reach the soil, they immediately burrow into it, and remain there through all the years of their pilgrimage to the last, when they ascend to the surface, where they remain, exposing themselves to the air occasionally till the time of their transformation is come. When the hour arrives, they come forth by night in great numbers, and crawl up trees, or any thing to which they can attach themselves by their claws ; they then by repeated efforts make a rent in their outer integument, through which they push out the head and body, leaving the shell looking like a perfect insect on the tree. A few hours are sufficient to give them strength to fly ; within a fortnight they lay their eggs ; and in less than six weeks the whole generation has passed away. It is well that they remain in the ground so long ; it gives time to the trees to recover from the injury occasioned by their burden. In fact it would be no great subject of regret, if the earth to which they betake themselves in the early stages of their existence should become their grave.

The plant-lice, which belong to this order, are a singular generation, and the alliance which exists between some species and the ants has often attracted attention. It is not so generally known, that there are some which live in the ground, where they destroy plants by clustering round the roots, in the same manner as others drain the juices from the leaves. This is much more convenient for the ants, who are thus saved the trouble and exposure of climbing trees in search of them, and moreover can have them in their own



habitations below. They appear to be fully sensible of the advantage, and take a degree of care of the *aphides*, which, if disinterested, would be quite sublime. If they are disturbed, the ants are at once up in arms. They carefully take up the *aphides* and convey them to a place of security ; they defend them from the attacks of other insects, and make their cause in every respect their own. They show the same solicitude for the eggs, taking care to keep them moist, and in fine weather bringing them to the surface to give them the advantage of the sun. But this concern is sufficiently explained by the fact, that the ants depend on the sweet fluid drawn by the *aphides* from the trees, for food to supply themselves and their young.

The downy plant-lice are the cause of the affection of apple trees, which is called in Europe *American blight*, under the impression that it came originally from this country. It seems to be a maxim with every nation, that no plague begins at home ; and vast pains are taken to exclude by quarantine regulations, the enemy which has the birthright of a native, and therefore, very naturally, makes itself at home. It is not common in this country as it is abroad, and some have doubted whether it exists ; but Mr. Buel found it on his apple trees, and Dr. Harris says that he has seen it in a few instances, though it still appears to be rare. The eggs are so small as to be invisible without a microscope, and are enveloped in a substance like cotton, supplied by the insect itself. They are deposited near the ground in crotches of the branches, or crevices of the bark, where the young appear in the spring, like small specks of mould upon the trees. As the young grow, the down increases, and serves as a means of conveyance, being light and easily borne by the wind, and thus enabling the insects to pass from one tree to another. They derive their nourishment from the sap of the bark and the *alburnum*, and in such quantities, that the leaves become yellow and the branches decay, till the whole tree is infested and destroyed. This and other similar instances can be dealt with by a faithful application of alkaline solutions, put on after scraping and brushing the tree. In the case of this insect, the roots must be included in the cleansing process as low as it is possible to reach them. There are cases, however, in which man has diligent and faithful allies to assist him, particularly the lady-birds, very good little beetles,

which deserve the favor with which they are regarded, since, unlike most insects, they do us more service than harm. Mr. Kirby says, that he has succeeded, simply by placing a few grubs of the lady-bird among the *aphides*, in exterminating them from a currant bush and a small tree.

But while this difficulty is not so common as to be alarming, another insect, or kind of bark louse, has spread itself very fast over the orchards of New England, being so obscure in its form and color as to attract no attention till it has already injured the tree. The insect is about one tenth of an inch in length, of an oval shape, resembling half a kernel of rye, though not so large, and attached by the flat side to the bark. They proceed from a small, muscle-shaped scale, containing thirty or forty eggs, which are hatched about the beginning of June. The young become stationary in about ten days, and throw out a quantity of bluish-white down, soon after which their transformations are completed, and the females deposit eggs. These insects soon destroy the bark on which they are found, and, unless arrested, will shortly complete the ruin of the tree. Strong alkaline solutions must be applied to them, and the time most favorable for the purpose is the early part of June. The titmouse and wren are both very efficient aids of the horticulturist in this kind of labor, and, like most other birds, deserve an amount of credit and protection which mankind have neither good feeling nor good sense enough to give them.

The order *Lepidoptera* embraces the caterpillars, which, by reason of their variety and overwhelming numbers, are perhaps our most formidable enemies, not merely as destroyers of vegetation, for some, which are wholly domestic in their habits, contrive to do as much mischief within doors as their vagrant relations in the orchards and fields. They are the young of moths and butterflies. Of these Dr. Harris has formed acquaintance with about five hundred species, which are natives of Massachusetts, and there are, he thinks, at least as many which are not yet described. The greater part of them subsist on vegetable food, some feeding on solid wood, some on pith, grains, and seeds, and many on leaves and flowers. As each female provides from two to five hundred eggs, a thousand of these insects will afford three hundred thousand, at least, to the first generation. If half these arrive at maturity, it will give forty-five millions to the

second, and nearly seven thousand millions in the third generation. This estimate is doubtless within the truth, and it serves to show in a striking manner what an amount of effort is required to contend with them, and how formidable, if neglected, a small evil may become.

In the family of *Sphinx* is a group called *Ægeria*, which contains some desperate enemies of man. One was well named by Mr. Jay, *exitiosa*, or the destructive, from its operations on the peach tree. Happily its movements are sufficiently obvious to the eye ; and, if proper care is given, the trees may be preserved. The insect is a slender, dark-blue, four-winged moth, having a slight resemblance to a wasp, and expanding, we mean the female, which is of course the most important character of the two, about an inch and a half. Her eggs are generally deposited in the month of July, sometimes much later, and are placed as near as possible to the surface of the ground. The grubs, as soon as hatched, begin upon the inner bark and sapwood, where they often girdle and completely destroy the tree. Any thing which compels them to lay their eggs higher on the stem, will make it impossible for them to eat their way to the root, where they calculate to pass the winter ; and, if the cold overtakes them above ground, it is fatal to them.

Of all caterpillars, the best known are those of the *Lasio-campian* race. They are the young of such moths, as fly only by night. Those to which we allude are seen in great numbers in our orchards, and particularly in the wild-cherry trees on their borders. The eggs are placed round the ends of the branches in a ring containing several hundred, covered and cemented together with a water-proof varnish, which protects them from the weather. When the leaves expand in the spring, the caterpillars are ready to begin their operations. The first is to form an angular web, resembling that of a spider, stretched on the forks of branches near the eggs. Under this tent, the caterpillars find shelter when they are not engaged in eating. In crawling from one branch or leaf to another, they spin a slender silken thread, which serves as a clue to conduct them back to their tent ; and, as this process is often repeated, their pathways become paved with silk, and thus afford them a safe and easy road. As they increase in size, their tent enlarges, till it acquires a diameter of eight or ten inches. In the early part of June, they begin to leave

the trees where they have lived in company, and after wandering a while secure themselves in some crevice, where they go through their transformations. Every nest in an orchard, if neglected, supplies tens of thousands in future years ; and such neglect deserves such retribution when so little care is required to remove them.

In the genus *Attacus*, are some, which may hereafter supply the place of the silkworm, having the advantage of being more hardy, and contented with such food as our forests can supply. Experiments, on a small scale, have been made with the silk of the *Cecropia*, which has been carded, spun, and woven into stockings, which are said to wash like linen. The *Cecropia*, however, does not bear confinement so well as the *Luna* and *Polyphemus*, which are easily reared, and make their cocoons as well in the house as in the open air. Dr. Harris observes, that, as the insects remain in the chrysalis state from September to June, they may be kept for unwinding at any leisure time in the winter.

Dr. Harris has given much attention to the *cutworm*, as it is called, from its appearance, which is so injurious to the young vegetation of our gardens ; and the result shows that the name comprehends a variety of insects, which, though resembling each other in the caterpillar state are quite different when on the wing. He procured a considerable number, all alike in color, though not in size. He did not particularly examine their markings, but, before the middle of August, five different kinds of moth made their appearance out of the chrysalids which they formed. That which is believed to come from the cutworm, is a moth which flies about our candles in great numbers in the latter part of the summer. He applies to it the name of *Agrotis devastator*. He thinks that they are hatched in the autumn, and, after remaining below the reach of frost in the winter, come to the surface and prepare for their unwelcome labors in the spring. The most effectual way to put a stop to their depredations is, to search out the destroyer and put him to death ; but, when such vegetables as the tomato are transplanted, they may be secured in their tender state by winding a bit of paper round the stem.

No one can have failed to observe the ravages of the detestable cankerworm, which is now extending itself over New England, destroying the beauty of vegetation in the leafy

month of June, and requiring so much pains to resist it, that many cultivators seem to submit to it in helpless despair. It was formerly supposed that the moths came out of the ground only in spring ; it is now known that they rise also in the autumn, and the early part of winter ; and, whatever application is made to prevent their ascending the tree, is necessary at those times as well as in the spring. The eggs are usually hatched at the time when the red currant is in blossom, and the caterpillars are employed upon the leaves for a month ; after that, they begin to let themselves down by silken threads to the ground, where they burrow and go through their transformations. It is hoped that the extent and magnitude of this evil will lead to more easy and effectual remedies than have yet been discovered. Certainly such an exact history as Dr. Harris has given of the changes and periods of the insect is indispensable to those who would devise means to prevent its depredations.

Another serious disturber of the peace of horticulturists is the apple worm, well known for its practice of forestalling the best part of the fruit in our orchards. The moth, which is often seen in houses, is distinguished from others by an oval spot of brown, edged with copper color, on the hinder margin of each of the fore wings. In July and the last of June, they fly about apple trees in the evening, in order to place their eggs in the hollow at the blossom end of the fruit. The eggs begin to hatch in a few days, and the young grub immediately makes for the heart of the apple. At first it is very small, and its presence is hardly perceptible ; but in three weeks it becomes large, and opens a tunnel through the side of the fruit, in order to get rid of the rubbish which gathers round it, and interferes with its motions. When the apple falls, an event which is hastened by its operations within, it makes use of this tunnel in order to escape into the sheltered places, where it goes through its transformation. Sometimes it reappears without delay ; but generally remains in the chrysalis state through the winter and the following spring. As they generally find shelter in the crevices of the bark, many will be destroyed by scraping it early in the season. It is also said, that, if an old cloth is wound about the tree, great numbers will resort to its folds, where they can be destroyed without much trouble.

The name *Moth* was formerly restricted to those familiar

inmates of our dwellings, which depend on man for food and raiment, that is, converting our clothing into food and lodging for themselves. Among these, the clothes moth, the carpet moth, the fur moth, and the hair moth, stand preëminent. They lay their eggs in May and June, and die when they have provided for the succession of their race. The eggs are hatched in about a fortnight, and the little grubs forthwith proceed to gnaw the substance on which they rest, making of the fragments a case for themselves, which they line with silk, enlarging it according to their growth, by lengthening it at the two ends, and setting in gores at the sides. This case is their house for the summer; they carry it with them as they move along their destructive way. In the autumn they cease to eat, and, fastening their cases to the cloth, they remain quiet during the winter; but in the next spring they change to chrysalids within their cases, and after twenty days reappear with wings. When prepared to lay their eggs they slip through cracks into closets, chests, and drawers, under the edges of carpets and the folds of curtains, showing a particular affection for woollen garments, and there lay the foundations of new tribes of similar destroyers.

As the readers of our journal, however worthy and enlightened, are not exempt from the usual doom, it may be well to direct their attention to the precautions which Dr. Harris recommends. Early in June it will be advisable to beat up their quarters, throwing open wardrobes, closets, chests, and drawers, and exposing garments, bedding, carpets, curtains, fur, and feathers, to the heat of the sun, since the moths are great lovers of darkness, like all other creatures whose deeds are evil. But other remedies must be vigorously applied, such as shaking, beating, and brushing, which will dislodge and destroy the eggs. In old houses, cracks in the floors and wainscots, and around the walls and shelves of closets, should be brushed with spirits of turpentine. Sheets of paper sprinkled with it, camphor in coarse powder, and leaves of tobacco, should be placed among the clothes when they are laid aside for the summer. Such articles as furs and plumes should be pasted up in bags of coarse paper, with leaves of tobacco interposed. Dr. Harris also says, that linings of carriages may be effectually guarded by sponging them on both sides with a solution of corrosive sublimate of mercury, made just strong enough not to leave a black stain on a white feather. Moths

can be killed by fumigating the article that contains them with tobacco smoke or sulphur, by enclosing them in a tight vessel, and plunging it in boiling water ; or by putting it into an oven heated to one hundred and fifty degrees of Fahrenheit's thermometer.

The bee-moth is another of these nuisances, sufficiently well known to those who have undertaken to supply themselves with honey. It had the honor or the infamy, whichever it may be, of being commemorated by Virgil in ancient times, and has often, in later ages, received benedictions from the husbandman, less poetical, perhaps, but equally significant. This pest was brought from Europe with the common hive-bees, — the old straw hive, which was formerly common there, affording it an excellent shelter. The male and female moth differ so much in size, that Linnæus and other naturalists supposed them to be distinct species, and gave them two different names. The female is much larger and darker colored than the male. There are two broods in the course of the year. Some of the first appear in their winged uniform at the last of April, or early in May ; those of the second abound most in the month of August ; but they are found in less numbers through the whole of the summer, and require the proprietor to be always on his guard. By day they remain quiet in the crevices, or on the sides, of the beehouse ; but in the evening, when the bees have entered, they hover round the hive, and take the opportunity to steal in at the door and lay their eggs. Those which cannot get in, lay their eggs on the outside, or on the stand ; and the little caterpillars either creep in at the cracks, or make a passage under the edges. Were the bees to discover them, the air of the hive would not be good for their constitutions ; but they show wonderful consciousness and skill in stealing through the waxen passages, which they break down and destroy. They are sometimes called the wax-moth, and this is more descriptive than the common name, because wax is their only food. They prefer the old to the new comb, and are therefore most abundant always in the upper part of the hive, in the oldest of the comb. Very vigorous powers of digestion must they have to thrive upon such food ; but they eat it with as much appetite as if it were the greatest luxury that ever was concocted. As soon as they are hatched, they begin to spin ; and each one makes for itself a strong tube of silk, in

which it can turn and move round at pleasure. In this it remains concealed during the day, and comes out at night when it cannot be seen by the bees. This case is enlarged as the grub increases in size, and for greater security is covered with grains of wax and rubbish, to protect the enclosed animal from the sting. Thus shielded, they move through the hive, consuming the wax, and filling the vacancy with their filthy webs, till at last the patience of the bees is worn out, and they desert the abodes where their skill and industry are applied in vain.

Bees suffer most from the moth in warm and dry summers. Weak swarms are more infested than large ones. The presence of the grubs is made known by the black grains and fragments of wax scattered over the floor. As soon as this appearance is discovered, the caterpillars and chrysalids must be sought out, and all the webs and cocoons, with the insects in them, must be carefully removed. This would better be done once a week ; but at any rate should be done early in September, when the cocoons are most abundant. The winged moths may be destroyed by setting shallow vessels, containing a mixture of honey or sugar with vinegar and water, near the hives in the evening ; great numbers will get into it and be destroyed. Hives of various construction are offered to the public as a security against the wax moth ; but which is most efficient, we have not as yet had an opportunity to determine.

Dr. Harris inclines to the belief that the European grain moth, *tinea granella*, is found in this country, but not generally observed, because confounded with the grain weevil. There is also another grain moth, which is very destructive in some parts of France, called the *Angoumois moth*, which he apprehends is the same with one which was described by Colonel Carter of Virginia as " the fly weevil, that destroys wheat." He has seen some wheat from New Haven, eaten by moths in the same manner as the Angoumois moth is said to consume it ; that is, a single grub lies concealed within a grain of the wheat, and thus devours in secret the mealy substance within the hull. Whatever the insect may be, it is ascertained that it can be destroyed by exposing the grain to a heat of one hundred and sixty-seven degrees of Fahrenheit, continued for twelve hours. A less degree of heat will answer, if applied for a longer time.



The order *Hymenoptera*, or membranaceous-winged, contains some insects of good reputation, such as ants and bees, and not many which are very injurious in the field or garden ; but they are well worth regarding on account of the wonderful instincts displayed in fulfilling the purposes of their existence. Nor are we required to go far to see the manifestations of their skill. The mud-wasp fastens its cells to the eaves of our houses, each containing a single egg, with some living spiders, kept in durance vile to furnish fresh meat for the young. The honey-bee enters the mansions provided for it, and there shapes its comb with inimitable precision, though it has no other mathematical instrument than its antennæ and its mouth. The ant labors everywhere in its mines, with an industry and enterprise which put to shame the tunnels and excavations of man.

The saw flies belonging to this order are so called from the tools with which the female is provided. They are double saws, lodged in a chink at the lower part of the body, like the blade of a knife in its handle. They are placed side by side, with their ends directed backwards, and so hinged to the under part of the body, that they can be drawn from the chink and moved up and down when used. They generally curve upward, and taper toward the end, and are toothed along the lower or convex edges. Each, like a carpenter's fine saw, has a back to steady it ; it is not fastened to the back, but slides backward and forward upon it. The blade is not only toothed on the edge, but has transverse rows of very fine teeth on one side, giving it the power of a file as well as a saw. With these instruments the females saw little slits in the stems and leaves of plants, and in these deposit their eggs.

One of the largest of the saw flies infests the American elm, laying its eggs upon the tree in June, that the young may feed upon its leaves. Another commits depredations on the pine and fir tree. To this Dr. Harris gives the name of *Lophyrus abietis*, the *Lophyrus* of the fir tree. The false caterpillars may be found upon the trees in June and July, so numerous and sociable, that sometimes two are found on the same leaf, feeding opposite to each other. When the time for transformation comes, they creep into crevices, or conceal themselves in the decayed leaves and rubbish at the foot of the tree, where some complete the process in August, and

others remain till the following spring. Another species preys upon the leaves of the grape-vine ; and all require attention on the part of the cultivator to prevent their increasing in numbers. It is well known that the rose-bush is defiled and injured by an insect of this description. The best remedy is probably that of Mr. Haggerston, a mixture of two pounds of whale-oil soap with fifteen gallons of water. This has been found sufficient to destroy canker-worms, plant lice, and red spiders, and certainly deserves to be faithfully tried on all these troublesome enemies of the garden, which, if resisted, will flee, or, what is still better, will lose the power to flee and torment us again.

The most formidable of the saw flies is that which<sup>1</sup> was described by Professor Peck, in his “ Natural History of the Slug-worm.” It lives on the cherry and the pear tree, eating away the upper surface of the leaves, and is sometimes so numerous that twenty or more collect on a single leaf. In the year 1797, they were so abundant that they perfumed the air. Their operations were unsavory as their smell. The tree which was laid waste, was compelled to put forth new leaves in the summer, and thus exhaust its vital energy, and forestall its preparation for another year. Happily they have enemies to limit their numbers ; mice and birds feed upon them in various stages of their existence, and a small ichneumon-fly stings their eggs, and deposits in each so punctured an egg of its own. The maggot which proceeds from the latter feeds upon the larger egg in which it dwells, and of course prevents its coming to life. In this small way the ichneumon is ascertained to do great and praiseworthy execution.

Under the head of *Diptera*, or two-winged, are included races of insects with which most of our readers have an extensive personal acquaintance, and which are more familiar than welcome to those who know them. They divide the empire of day and night between them, the mosquitoes raging by night and the flies destroying our peace by day. It is some comfort to know that the number of these visitors we shall have, rests in part with ourselves, since they are born and cradled in filth, such as is found in the neighbourhood of barns. Heaps of manure are their foundling-hospitals ; and if these are not supplied to them by public or private charity, their reign is less joyful and triumphant. In fact, in all our

relations with these troublesome creatures, it is well to remember, that many of the evils of which we complain, are only our own carelessness, want of neatness, and other domestic iniquities, visited in this winged form upon ourselves. The young insects are fleshy grubs, advantageously known by the name of maggots, which go through their transformations within themselves, their skin hardening to supply the place of a cocoon, from which, in due time, they force their way, and proceed rejoicing to cultivate an acquaintance with men.

The common house fly is sufficiently troublesome ; but we are told by Dr. Harris that they may be destroyed by a strong infusion of green tea, well sweetened, and that they may be excluded from apartments by a netting with threads half an inch or more apart, stretched over the windows on one side of the room. It appears that they will not attempt to fly between meshes or threads into a room, unless they see light shining through from other windows ; information which may be valuable to those, who live in the neighbourhood of fly nurseries, which they cannot escape or control. The common house-flies are simply annoying by their pertinacity and their numbers ; but, toward the close of summer, the stable-flies, which resemble them in every thing but their sharp proboscis, enter our dwellings at the approach of rain, and bite us through our stockings with a sting equal to that of the bee or hornet, save that it leaves no poison behind. If any one is curious to examine this pest, he may know it by its proboscis, long and slender, and projecting horizontally before its head. It is honored with the name of *Stomoxys calcitrans*, that is, *sharp-mouthed kicking*, — the one describing the cause, the other the effect. Animals are so tormented by their incessant persecution, that they become almost frantic under the visitation.

The meat fly is found through the summer about places where meat is kept, a large buzzing insect, not particularly pleasing to the smell. It is of a blue-black color, with a blue, broad, and hairy body. Its eggs are known by the name of *fly-blows*. They hatch in two or three hours, and the maggots proceeding from them get their growth in two or three days, after which they creep into some crevice, or the ground if they can reach it, and pass through the transformation which raises them to the dignity of flies in two or three days more. There is another smaller blue-green meat-fly, with

black legs, which takes carrion in the fields under its charge. They both officiate in useful services, their whole care being to remove animal decay as fast as possible, before it can waste its sweetness on the air.

Flower flies differ from the house fly in the smaller size of their winglets, and the mesh in the middle of their wings. They are also smaller, and their wings spread less when at rest. It is not to be supposed from their name, that they are very refined ; at least in all stages of their existence. In the larva state, they generally live in manure or decayed vegetable matter. Some of the tribe feed on radishes, others on turnips, and others on onions. The fly has been very destructive to this savory crop in Europe, and Dr. Harris has found a fly so exactly answering to the description of the transatlantic nuisance, that he thinks it no breach of charity to consider them as one.

Our largest gad-fly or horse-fly is a creature of formidable dimensions, nearly an inch in length, with wings expanding nearly two inches, its color black, and covered with a whiteish down, like a plum. Its eyes are very large, almost meeting on the top of the head. The *orange-belted*, as it is called from the color of the girdle that surrounds its black body, is smaller than this. But there are several others which have not been described, though notorious enough from their power to annoy. Their proboscis is armed with half a dozen sharp needles, which will penetrate the toughest skin, and horses are beset with them till they are sometimes driven to despair. It is said that a decoction of walnut leaves, applied to the animal, will prevent their attacks, and, as it certainly can do no harm, it is worth the trial.

The bee-flies, which are so called from their way of life, are not troublesome like the last mentioned. They get their living from early flowers, sucking out the honey with their proboscis, which is sometimes longer than the body of the fly. They also resemble the bee in appearance, having a short, rounded body, covered with yellowish hairs. They fly very fast, suddenly stopping every little while and remaining suspended in the air on their long horizontal wings.

The soldier-flies are not so fierce as their names would lead us to suppose. Their proboscis is not fitted for offensive war on other insects, but only for sucking the sweet juice of flowers. There are, however, cannibals among the flies,

the chief of which is the orange-banded Midas, which is sometimes found an inch and a quarter in length with a proportionate extent of wings. Its color is black, with the orange band which gives it a name upon the hinder body. The name *Midas* comes from its long antennæ, which are thought to resemble the decorations of the head of its namesake in ancient times. The early stages of its existence are spent in decayed logs and stumps in the woods.

Among the two-winged insects are some which would be rather surprised to find themselves in such worshipful company, since, so far from having two wings, they are not even equipped with one. Among these is the snow-gnat, which, in its appearance, resembles a spider. There is a poiser on each side of the body, to supply the place, or, at least, to give the appearance of wings. Their home is on the ground, and the female, which is provided with a borer like that of a grasshopper, bores into it to lay its eggs.

Many gnats, however, are furnished with wings, as most of us, to our sorrow, have reason to know. In some parts of New England and Canada, is a kind of midge, which peoples the air in swarms in the month of June, and which is sufficiently formidable to the feeling, though so minute to the eye that the Indians in Maine give it the name of *No-see-'em*. They would not be seen, were it not for their wings, which are of a light color, mottled with black. Toward evening they come out, and, creeping under the clothes, produce an intolerable irritation by their bite, though they draw no blood. On the mosquitoes it is needless to enlarge; our readers are so generally acquainted with them and their operations, that not even Dr. Harris would be able to add much to their light and satisfaction on the subject, without pointing some way to destroy them. Surely, one would suppose, that, in this day of creature comforts, some such means would be found. Now this little insect keeps half mankind in bodily fear. Wherever he winds his tiny horn, they prepare to suffer without resistance. Such universal submission to such an insignificant enemy, as if the evil were beyond redress, is strange enough, and, we trust, will not always be.

We cannot, however, pursue this subject further. Nor is it necessary; for those who are interested in entomology, either as students or cultivators, will doubtless soon make themselves acquainted with the contents of this Report; not by means of

the present publication, if we may call it so ; for this is not published, in the usual sense of the term, but only furnished to a number which must be small in comparison with the number of those who would wish to read it. But we are happy to hear that the Reporter has made arrangements with the proper authorities, by which he is allowed to print a small edition at his own expense. In this way, he may be able to supply the public demand, and also, we hope, to secure himself some additional compensation for his labors. It is the labor of a life, in which he is engaged. If he pursues his way with the same zeal and energy as heretofore, every succeeding year must add greatly to his stock of information, and, at some future time, we shall look to him for an extended work on the insects of this country. The materials of the present Report would naturally make part of it. Such a publication would meet a want which is now universally felt ; and, even if he found no other adequate recompense, which we should not willingly believe, he will at least secure an enviable and permanent fame.

Of the execution of this work, after the opinion we have already expressed, it is hardly necessary to speak. The author writes in a manner which is always graceful in one familiar with his subject and warmly interested in it, not considering high literary finish so important as a direct, forcible, and clear expression of his meaning. This is the style appropriate to scientific descriptions. It is all the better for being unambitious ; if it is only scholarlike and manly, good taste can require nothing more. We enjoy, not only the material of this Report, but the manner in which it is presented ; and, if the author can find leisure to prepare an elementary work on his favorite science, we have no doubt that in style, as well as substance, it will be such as to make the study generally attractive, and thus to secure an increasing number of intelligent and active observers.

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Two Discourses on the Nature and Province of Natural, Revealed and Experimental Religion. By Orville Dewey, Pastor of the Church of the Messiah, in New York. New York: David Felt & Co. 8vo. pp. 32.

Christian Union. A Discourse delivered in Clarkson Hall, Sunday, September 12th, 1841. By Frederick A. Eustis, Philadelphia. 8vo. pp. 16.

A Sermon Preached at West Cambridge, August 1st, 1841, the Sabbath after the Death of Philip Augustus Whittemore, oldest son of Philip and Sarah Whittemore. By Rev. David Damon. Published by Request of the Parents and Friends of the Deceased. Boston. 12mo. pp. 16.

The Church. A Discourse, delivered in the First Congregational Unitarian Church of Philadelphia, Sunday, May 30th, 1841. By William E. Channing. Printed by Request of the Society. Philadelphia: J. Crissy, Printer. 8vo. pp. 57.

### VOYAGES AND TRAVELS.

Incidents of a Whaling Voyage. To which are added Observations on the Scenery, Manners, and Customs, and Missionary Stations, of the Sandwich and Society Islands, accompanied by numerous Lithographic Prints. By Francis Allyn Olmsted. New York: D. Appleton & Co. 12mo. pp. 360.

Visit to Northern Europe; or Sketches Descriptive, Historical, Political and Moral, of Denmark, Norway, Sweden, and Finland, and the Free Cities of Hamburg and Lubeck, containing Notices of the Manners and Customs, Commerce and Manufactures, Arts and Sciences, Education, Literature, and Religion, of those Countries and Cities. By Robert Baird. With Maps and Numerous Engravings. New York: John S. Taylor & Co. 2 vols. 12mo. pp. 347 and 350.

The Glory and the Shame of England. By C. Edwards Lester. New York: Harper & Brothers. 2 vols. 12mo. pp. 253 and 293.